

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.:

Filing Date: Herewith

Applicant: Toshiya Yokogawa, et al.

Group Art Unit: 2814

Examiner:

Title: Semiconductor Device

Attorney Docket: 5077-000073/COA

Director of the United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Sir:

Pursuant to 37 C.F.R. §§ 1.56, 1.97 and 1.98, Applicant hereby submits an Information Disclosure Statement for consideration by the Examiner.

I. LIST OF PATENTS, PUBLICATIONS, AND OTHER INFORMATION

The patents, publications and other information submitted for consideration by the Office (except unpublished U.S. patent applications) are listed on Form 1449 attached hereto.

II. COPIES

A. X Submitted herewith is a legible copy of (i) each U.S. patent application publication and U.S. and foreign patent; (ii) each publication or that portion which caused it to be listed; (iii) for each cited pending U.S. application, the application specification including the claims, and any drawing of the application which caused it to be listed including the claims directed to that portion; and (iv) all other information or that portion which caused it to be listed.

B. X Any patents, publications or other information which are listed on Form 1449 or on the copies of PTO-892, but which are not enclosed herewith, were previously cited by or submitted to the PTO in one of the following applications which has been relied upon for an earlier filing date under 35 U.S.C. § 120:

U.S. Serial Number
09/980,598

U.S. Filing Date
November 1, 2001

C. This is a PCT application in the entry of the National Phase in the United States. A copy of the International Search Report is attached for the Examiner's information. The documents listed on the International Search Report are listed on the attached Form-1449 for consideration by the Examiner and for listing on any patent resulting from this application. Since the International Search Report was from the US, EPO, or JPO search authorities, copies of these references should have been supplied to the USPTO under the trilateral agreement and are believed to be in the file of the above-identified application. (MPEP 1893.03(g))

III. CONCISE EXPLANATION OF THE RELEVANCE (check at least one box)

A. X Except as may be indicated below in (B), all of the patents, publications or other information are in the English language (concise explanation not required).

B. A concise explanation of the relevance of each patent, publication or other information listed that is not in the English language is as follows (see 37 C.F.R. § 1.98(a)(3)):

1. See the attached foreign patent office communication from a counterpart foreign application:
2. English translations are provided for:
3. Other:

C. The following additional information is provided for the Examiner's consideration.

IV. CROSS REFERENCE TO RELATED APPLICATION(S)

A. X The Examiner is advised that the following co-pending application(s) contain(s) subject matter that may be related to the present application. By bringing this(these) application(s) to the Examiner's attention, Applicant(s) does(do) not waive the confidentiality provisions of 35 U.S.C. § 122.

<u>Serial No.</u>	<u>Filing Date</u>	<u>Art Unit</u>
PCT/JP00/08155	November 20, 2000	
09/980,598	November 1, 2001	2814

V. THIS IDS IS BEING FILED UNDER

A. X 37 C.F.R. § 1.97(b): (check only one box)

1. X within three months of the filing date of a national application other than a continued prosecution application under § 1.53(d) (37 C.F.R. § 1.97(b)(1)). No fee or certification is required.

2. ____ within three months of the date of entry of the national stage as set forth in §1.491 in an international application (37 C.F.R. § 1.97(b)(2)). No fee or certification is required.

3. ____ before the mailing of a first Office Action on the merits (37 C.F.R. § 1.97(b)(3)). No fee or certification is required. In the event that a first Office Action on the merits has been issued, please consider this IDS under 37 C.F.R. § 1.97(c) and see the certification under 37 C.F.R. § 1.97(e) below; or, if no certification has been made, charge our deposit account a fee in the amount of \$180.00 as required by 37 C.F.R. § 1.17(p).

4. ____ before the mailing of a first Office Action after the filing of a request for continued examination under 37 C.F.R. § 1.114. No fee or certification is required.

B. ____ 37 C.F.R. § 1.97(c): (check only one box)

- before the mailing date of either any Final Office Action under 37 C.F.R. § 1.113, a Notice of Allowance under 37 C.F.R. § 1.311, or an action that otherwise closes prosecution.

1. ____ No certification; therefore, a fee in the amount of \$180.00 is required by 37 C.F.R. § 1.17(p).

2. ____ See the certification below. No fee is required.

C. ____ 37 C.F.R. § 1.97(d):

- after the mailing date of either a Final Office Action under 37 C.F.R. § 1.113 or a Notice of Allowance under 37 C.F.R. § 1.311, yet on or before payment of the issue fee.

1. ____ See the certification below. A fee in the amount of \$180.00 is required by 37 C.F.R. § 1.17(p).

VI. CERTIFICATION UNDER 37 C.F.R. § 1.97(e): (check only one box)

The undersigned hereby certifies that:

A. ____ each item of information contained in this IDS was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this IDS (See 37 C.F.R. § 1.97(e)(1)). See further statement under 37 C.F.R. § 1.704(d) below in section VII, if applicable; or

B. ___ no item of information contained in this IDS was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in this IDS was known to any individual designated in 37 C.F.R. § 1.56(c) more than three months prior to the filing of this IDS (See 37 C.F.R. § 1.97(e)(2)).

C. ___ Some of the items of information were first cited in a communication from a foreign patent office. As to this information, the undersigned hereby certifies that each item of information contained in this IDS was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this IDS. As to the remaining information, the undersigned hereby certifies that no item of this remaining information contained in this IDS was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in this IDS was known to any individual designated in 37 C.F.R. § 1.56(c) more than three months prior to the filing of this IDS.

VII. STATEMENT UNDER 37 CFR 1.704(d)

The undersigned hereby states that:

___ each item of information contained in this IDS was cited in a communication from a foreign patent office in a counterpart application and this communication was not received by any individual designated in 37 C.F.R. 1.56(c) more than thirty days prior to the filing of this IDS.

VIII. PAYMENT OF FEES (check only one box)

A. ___ A check in the amount of \$180.00 is enclosed for the above-identified fee.

B. ___ Please charge Deposit Account No. 08-0750 in the amount of \$180.00 for the above-indicated fee. A duplicate copy of this paper is attached.

The above references are being cited only in the interest of candor and without any admission that they constitute statutory prior art, contain matter which anticipates the invention, or which would render the same obvious, either singly or in combination, to a person of ordinary skill in the art. Furthermore, this Information Disclosure Statement shall not be construed as a representation that a search has been made.

If it is determined that this IDS has been filed under the wrong rule, the PTO is requested to consider this IDS under the proper rule (with a petition if necessary) and charge the appropriate fee to Deposit Account No. 08-0750.

Please charge any additional fees or credit any overpayment pursuant to 37 C.F.R. § 1.16 or § 1.17 to Deposit Account No. 08-0750.

Respectfully submitted,

Dated: July 23, 2003

By: Greg Stobbs
Gregory A. Stobbs
Reg. No. 28,764

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. Box 828
Bloomfield Hills, Michigan 48303
(248) 641-1600

FORM HDP-1449 (Based on Form PTO-1449)

**PATENT AND TRADEMARK OFFICE
INFORMATION DISCLOSURE CITATION**
(Use several sheets if necessary)

Sheet 1 of 2

ATTORNEY DOCKET NO.

5077-000073/COA

SERIAL NO.

APPLICANT

Toshiya Yokogawa, et al.

FILING DATE

Herewith

GROUP

2814

U.S. PATENT DOCUMENTS

Ref. Desig.	Examiner's Initials	Document Number	Date	Name	Class/ Subclass	(If appropriate) Filing Date
1.		3,739,243	6/12/1973	Semichon, et al.		
2.		4,882,609	11/21/1989	Schubert, et al.		
3.		6,388,272	5/14/2002	Odekirk		
4.		5,488,237	1/30/1996	Kuwata [New art]		

FOREIGN PATENT DOCUMENTS

Ref. Desig.	Examiner's Initials	Document Number	Date	Country	Class/ Subclass	Translation Yes	No
1.		WO 01/67521 A1	9/13/2001	WIPO		Abstract	
2.		WO 01/93339 A1	12/6/2001	WIPO		Abstract	
3.		EP 0612104 A2	8/24/1994	Europe		Abstract	
4.		JP 54-132173	10/13/1979	Japan		Abstract	
5.		JP 5-13446	1/22/1993	Japan		Abstract	
6.		JP 6-349860	12/22/1994	Japan		Abstract	
7.		JP 9-289216	11/4/1997	Japan		Abstract	
8.		EP 0555886 A2	8/18/1993	Europe [New art]			

OTHER DOCUMENTS (including Author, Title, Date, Pertinent Pages, etc.)

Ref. Desig.	Examiner's Initials	
1.		D.W. Van der Weide, "Delta-doped Schottky diode nonlinear transmission lines for 480-fs, 3.5-V transients", Applied Physics Letters, Vol. 65, No. 7, 15 August 1994, pp. 881-883.

Date Considered:

Examiner:

EXAMINER: Please initial if citation considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<p>FORM HDP-1449 (Based on Form PTO-1449)</p> <p>PATENT AND TRADEMARK OFFICE</p> <p>INFORMATION DISCLOSURE CITATION</p> <p>(Use several sheets if necessary)</p> <p>Sheet 2 of 2</p>	ATTORNEY DOCKET NO.	SERIAL NO.
	5077-000073	
	APPLICANT	
	Toshiya Yokogawa, et al.	
	FILING DATE	GROUP
	Herewith	2814

OTHER DOCUMENTS (including Author, Title, Date, Pertinent Pages, etc.)		
Ref. Desig.	Examiner's Initials	
2.		A. Konstantinov, et al., "Investigation of lo-hi-lo and delta-doped silicon carbide structures", Mat. Res. Soc. Symp. Proc. Vol. 640, 2001, pp. H2.4.1-6.
3.		Shui Jinn Wang, et al., "Schottky/Two-Dimensional Hole Gas Silicon Barrier Diodes with Single and Coupled Delta-Doped Wells", Jpn. J. Appl. Phys. Vol. 33, No. 4B, Part 1, 1 April 1994, pp. 2429-2434.
4.		W.C. Hsu, et al., "A Quantum Well- doped GaAs Fet Fabricated by Low-Pressue Metal Organic Chemical Vapro Deposition", Solid-State Electronics, Vol. 34, No. 6, 1 June 1991, pp. 649-653.
5.		S.M. Bedair, "Selective-area and sidewall growth by atomic layer epitaxy", Semiconductor Science and Technology, Vol. 8, No. 6, 1 June 1993, pp. 1052-1062.
6.		European Patent Publication No. EP 0 309 290 A1
7.		"Characterization of Double Pulse-Doped Channel GaAs MESFET's", Shigeru Nakajima, et al., IEEE Electron Device Letters, Vol. 14, No. 3, March 1993, pp. 146-148.
8.		"Stark Effect Studied in -doped GaAs Structures", A. Ben Jazia, et al., Semicond. Sci. Technol. 12 (1997), pp. 1388-1395.
9.		"Vertical Hot-Wall Type CVD for SiC Growth", Kunimasa Takahashi, et al., Materials Science Forum Vols. 338-342 (2000), pp. 141-144.
10.		"Electronic Properties of Nitrogen Delta-Doped Silicon Carbide Layers", Toshiya Yokogawa, et al., Mat. Res. Soc. Symp. Proc. Vol. 640 (2001), pp. H2.5.1-H2-5-6.
11.		Partial Supplementary European Search Report EP 00 97 6350, 12/20/2002.

Examiner:	Date Considered:
-----------	------------------

EXAMINER: Please initial if citation considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.